

JOHNSON et al. -- 09/855,903
Client/Matter: 011765-0302034

IN THE DRAWINGS:

Please replace Figure 2 with Figure 2 as shown in the attached replacement sheet of such figure.

JOHNSON et al. -- 09/855,903
Client/Matter: 011765-0302034

REMARKS

Claims 1-10 are pending. By this Amendment, Figure 2 is amended; the specification is amended; and claims 1, 6 and 10 are amended. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Figure 2 was objected to. Figure 2 has been amended in accordance with the suggestion of the Office Action. Reconsideration and withdrawal of the objection to Figure 2 are respectfully requested.

Claims 1-10 were rejected under 35 U.S.C. §103(a) over McKeown et al. (U.S. Patent 5,923,644) in view of the admission of prior art on page 2, last paragraph and page 9, line 20-page 10, line 7. The rejection is respectfully traversed.

Claim 1 recites an arbitration method for selecting the connections to be made by a crossbar switch of a data switching system between a plurality of ingress ports and a plurality of egress ports. The method includes a request step of at least one ingress port transmitting one or more connection requests indicating egress ports to which a connection is required, a grant step of examining the connection requests, and, for each egress port for which there is a connection request, selecting one request for grant, and generating a grant signal indicative of the selected requests, and an accept step of examining the grant signals and, for each ingress port for which there is a grant signal, selecting one grant signal to accept, thereby defining an ingress to egress port connection across the crossbar switch. The method further includes employing, for each possible combination of an ingress port and an egress port, a respective weight value, a connection request only being selected in the grant step if the corresponding weight value is not zero. Each time a connection is made in the crossbar switch involving an ingress port and an egress port, the corresponding weight value is decremented. In the grant step, if for a given egress port, there are no connection requests having non-zero weight values, the weight values are reset to default values before selection.

The Office Action on page 4 alleges that McKeown et al. teach an arbitration method for selecting the connections to be made by a crossbar switch 22 of a data switching system between a plurality of ingress ports (Q_M) and a plurality of egress ports (C_M). The Office Action concludes that it would have been obvious to use the arbitration method for selecting the connections of a plurality of ingress ports and egress ports as taught by McKeown et al. in the system of Figure 2 of the present application. It is respectfully submitted that there is no motivation or suggestion to combine the teachings of McKeown et al. with Figure 2 of the

JOHNSON et al. — 09/855,903
Client/Matter: 011765-0302034

present application, and even assuming such motivation existed, such a combination would not include all the features of claim 1 and would fail to establish a *prima facie* case of obviousness.

The Office Action on page 4 alleges that McKeown et al. teach in column 6, lines 47-54, a grant step of examining connection requests and, for each egress port for which there is a connection, selecting one request for grant, and generating a grant signal indicative of selected request. However, it is respectfully submitted that column 6, lines 47-54, of McKeown et al. do not teach the claimed grant step. As disclosed in column 6, lines 47-54, of McKeown et al. the first processing step is to load cells into queues. Thereafter, weights are assigned to the head-of-line (HOL) cells. Subsequently, the HOL cells are designated for processing and the HOL cells with the highest weights are accepted for routing to the designated outputs. Finally, the crossbar switch is activated to route the selected cells to their respective outputs.

Column 6, lines 47-54, of McKeown et al. disclose assigning weights to HOL cells, designating HOL cells for processing where the cells with the highest weights are accepted for routing to their designated outputs and finally routing the selected cells to respective outposts. In other words, column 6, lines 47-54, of McKeown et al. do not disclose generating a grant signal indicative of a selected request, but merely discloses the actual step of routing selected cells to respective output. The Office Action on page 5, alleges that McKeown et al. disclose in column 7, lines 21-24 and 55-57, that the method includes, for each possible combination of an ingress port and an egress port, a respective weight value is assigned. It is respectfully submitted that column 7, lines 21-24 and lines 55-57 of McKeown et al. do not disclose or suggest this feature. As disclosed in column 7, lines 21-24, of McKeown et al., at the beginning of every cell time, each input calculates the weight of the new cell/residue at its HOL based on: (a) the age of the cell/residue (the older, the heavier the weight); and (b) the fanout of the cell/residue (the larger, the lighter the weight). What McKeown et al. disclose in column 7, lines 21-24, is that each cell is assigned a weight value, not that each possible combination of ingress port and egress port are assigned weight values, as recited in claim 1. See also, column 7, lines 10-13, of McKeown et al. which discloses that the technique works by assigning weight values to input cells based on their age and fanout at the beginning every cell time. In other words, the weight values are assigned to the input cells, not combination of ingress ports and egress ports, and it is these weights that are

JOHNSON et al. -- 09/855,903
Client/Matter: 011765-0302034

then used by the outputs of McKeown et al. when deciding which requests to satisfy. See also column 7, lines 57-61, of McKeown et al.

The Office Action on page 5 also alleges that McKeown et al. disclose in column 8, lines 36-42, that each time a connection is made in the crossbar switch involving an ingress port and egress port, the corresponding weight value is decremented. What McKeown et al. actually disclose in column 8, lines 36-42, is that when a grant signal is received from the accept schedule unit it is applied to a logic circuit which operates to remove the granted signal from a list of output destinations. In other words, if a bit is set for output destination in the destination register and if the output destination is served, the grant signal operates through the logic circuit to toggle the set bit. McKeown et al. do not disclose or suggest the feature of decrementing a corresponding weight value when the a connection is made on the crossbar switch as recited in claim 1. In addition, as discussed above, McKeown et al. do not disclose or suggest assigning weight values for each possible combination of an ingress port and an egress port, McKeown et al. disclose assigning a weight value to input cells.

As the combination of the admitted prior art and McKeown et al. fail to disclose, at least, these features recited in claim 1, the combination fails to include all the limitations of the claim and fails to present a *prima facie* case of obviousness.

It is also respectfully submitted that there is no motivation or suggestion, either in the admitted prior art or McKeown et al., or in the knowledge generally available to one of ordinary skill in the art, to combine the admitted prior art and McKeown et al. in the manner alleged by the Examiner. As disclosed in column 2, lines 26-34, of McKeown et al., the first processing step is to load input cells into a set of input queues. Each of the input cells specifies one or more output cells. Selected output cells are accepted from HOL input cells at the set of input queues in a manner to concentrate unacceptable output cells residue among a subset of the input queues. As further disclosed in column 3, lines 40-45, the residue concentration scheduler 20 grants access based upon a technique that concentrates on unaccepted output cell residue among as few of the input queues as possible. In other words, the invention of McKeown et al. is to concentrate unaccepted output cell residue among a subset of input queues, not to provide an arbitration method that selects the connections to be made by a crossbar switch of data switching system between a plurality of ingress ports and plurality of egress ports by, amongst other processes, employing a respective weight value for each possible combination of an ingress port and an egress port, as in the claimed invention.

JOHNSON et al. -- 09/855,903
Client/Matter: 011765-0302034

Accordingly, the combination of McKeown et al. and the admitted prior art fails to establish a *prima facie* case of obviousness.

Claims 2-5 recite additional features of the invention and are allowable for the reasons discussed above with respect to claim 1 and for the additional features recited therein.

Claim 6 recites a data switching system in which a crossbar switch makes connection between a plurality of ingress ports and a plurality of egress ports. The switch includes, *inter alia*, a working register storing a respective weight value for each possible combination of an ingress port and an egress port.

As discussed above, McKeown et al. do not disclose or suggest a respective weight value for each possible combination of an ingress port and an egress port. McKeown et al. disclose a weight value for each input cell, but not for each possible combination of an input cell and an output cell. Accordingly, the combination of McKeown et al. and the admitted prior art fails to include all the limitations of claim 6 and fails to present a *prima facie* case of obviousness.

As also discussed above, it is respectfully submitted that there is no suggestion or motivation either by McKeown et al., the admitted prior art, or in the knowledge generally available to one of ordinary skill in the art, to combine McKeown et al. and the admitted prior art in the manner alleged by the Examiner. Therefore, the combination of McKeown et al. and the admitted prior art fails to establish a *prima facie* case of obviousness.

Claims 6-10 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 6 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1-10 over McKeown et al. in view of the admitted prior art are respectfully requested.

In view of the above amendments and remarks, Applicants respectfully submit that all the claims are allowable and that the entire application is condition for allowance.

JOHNSON et al. -- 09/855,903
Client/Matter: 011765-0302034

Should the Examiner believe that any thing further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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